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Contemporary Society, Technology and Sustainability

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Abstract: The notion of a sociotechnical system is still developing and evidence can be viewed in a series of recent articles that has appeared over the last few years. With titles like Technological Forecasting and Social Change, Technology Analysis, and Strategic Technology Management, and, similarly, Technology/Knowledge Society and Sustainability are all buzzword terminology in a rapidly moving field, migrating from the scientific periphery to mainstream culture of a technology driven society. With the advent of global turmoil and the financial reins of 2008 credit crunch, the topic of sustainability and contemporary society is ever more concerning, as for years we as a society and our economy have been driven by two key measures of success profit and loss statements and our quarterly earnings. This article attempts to provide a brief assessment of a sizable body of literature, it also aims to provide a deeper understanding of the relationship between contemporary society, technology in sustainability from an engineering perceptive. It was found that contemporary society is profoundly reliant on technology, and for sustainability to be considered we call for a new legacy, not a continuation of the past.

Keywords: Sustainability, Contemporary Society, Technology, Engineering

Introduction

EXACERBATED BY MUCH publicity, globalization, climate change, sustainability have motivated numerous conferences and symposiums particularly in the science-techno world, whereas scientist and engineers alike have questioned their respective roles towards the evolution of knowledge society since, culture, technology and engineering are all intertwined. As a result the study of technology and society is vital in sustainability considerations. As many of the current trajectories of development are not sustainable, for example of the large realm of innovation possibilities, only a few are selected and used as the basis for further development. The selection has to do with economics (costs and prices) but also with expectations and institutions in the widest possible sense. Traditionally society has favoured innovations that fit existing regimes, with limited consideration for environmental risk. However today, environmental problems pose immediate threats and resource use poses a long-term problem..

Today's society is immersed in technology; Science and Technology are among the most potent forces transforming human life on earth in the new millennium Grove (1980) Beyler (2003) McGinn R, (2005), Gudmund,(2006). According to Bolter (1984), some technologies occupy a special place in their age. The clock and the steam engine in Western Europe in the 17th and 19th centuries, respectively, not only changed the world in a material sense, but they also provided new ways by which people viewed and understood both their physical and metaphysical worlds. Clockwork was the model of the universe showing the movements of heavenly bodies; the steam engine became the metaphor for the universe in the 19th cen-

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tury. We begin this discussion by noting that the 21st century has seen extraordinary advancements in the world technologies whose antecedents are more than 100 years in the making (Webster, 2002). Smith, et al, 2005; smith 2003, 2004, 2005 studied critical analysis of environmental policy processes; and research into relationships between technology and sustainable development whilst Bas van Vliet et al, 2005 looked at the Infrastructure of Consumption, i.e. the role of providers and consumer, Shove (2003, 2007,) investigated sociology changes in the evolution of consumption and technology. Viewing the literature from an evolutionary perspective let us visit the work of Voss and Kemp, (2005); Rip (2004); Rotmans (2004); Rotmans et al (2001); Kemp (1994,1997,1998,2000); Kemp et al (1998); Geels and Kemp (2006,2007); Geels, et al ., 2008, Schot, and Geels, (2007,2008) ; Rip and Kemp (1998) ; Hoogma et al , (2002) which highlight that there is a vital need for redirection of development involving system change.

Discussion

From the moment our ancestors started to settle down and build cities, we have had to find solutions to the problems that success brings. “For the past 10,000 years, problem solving has produced increasing complexity in human societies Tainter, (2006).In order to appreciate the ways contemporary society and technology interrelate, we need to visit the rudiments modern culture. The social shaping of technology (SST) revealed that cultural and social groups influenced technological change and innovation in any given environment (MacKenzie and Wajcman, 1985). This broad thematic spectrum in society that points to a high degree of penetration of new technology Heesen (2004), which has fostered innovation, knowledge, mobility, transparency, and globalisation. Consequently this has formed the impetus to this new culture of technology. Similarly the access to enhanced and instant modes of communication has produced a new dynamic of social movements and given rise to new kinds of social identities Castells, (1996). The impact of these new technologies on modern society has been undoubtedly beneficial but some might argue the contrary. Collectively globalization and technology form undividable inseparable bond, in particular communication technology. Hence technology attributed change in contemporary society is a phenomenon that perhaps has influenced our perceptions and expectations. Whether Technology attributed change is evolutionary or devolutionary, science, technology and society are an undividable trio, resulting in daily life being itself an intermingled affair with technology. For example the following are some terms that have emerged in recent times as a result of technology attributed change are “Global village”, “technocrats”, “information society”, “information age”, and “knowledge society” these are a few of an apophenia of change, nonetheless all these terms indirectly imply a dependability on electricity. Finally, Forester (1987); Sladovich (1991);Cassedy and Grossman (1998); Harvey and Chrisman, (1998); Michael (2000); Jasanoff (2004); Ito et al (2005), studies has posited that technology and society are inseparable, and form an inseparable elements in a complex sociotechnical system. Thus, the determinants of contemporary society are based on historical continuity of development, with technology being the characteristics that differentiate it. Similarly research in the field of science and technology had gathered evidence that science is not separate from society and that it does not discover uncontested ‘truths’ that are then translated into policies. Rather, we have to assume a co-production of scientific claims, political decisions and social order, this goes against the traditional view that science and society are separate and that sound knowledge

influences public policy in a rather linear fashion, Grundmann, (2007). "No idea is more provocative in controversies about technology and society than the notion that technical things have political qualities" Winner, (1986); Pool, (1997). "Science and technology (are) important. But scientists also need to understand that economic prosperity and defence probably rank higher." Australian Politician, (January, 2001), Parsons (2001), the words above illustrate dramatically the gulf between science and politics. What the quote actually tells us is that this Australian politician not only believes that science and technology are divorced from economic prosperity and defence issues, he or she believes they are in competition with other critical priorities in the field of public policy making. According to Grundmann (2007) research in the field of science and technology studies has gathered much evidence that science is not separate from society and that it does not discover uncontested 'truths' that are then translated into policies. Rather, we have to assume a co-production of scientific claims, political decisions and social order (Latour, 1987; Jasanoff and Wynne, 1998; Jasanoff, 2004).

Tainter, (2006) problem solving has produced increasing complexity in human societies. Society is becoming even more dependent on engineering and technology (Chisholm, 2003). Western industrial civilisation has become bigger and more complex than any before it by exploiting new sources of energy, notably coal and oil, but these are limited MacKenzie ,(2008). Western civilizations in the late twentieth century are dependent on a continuous, reliable supply of energy. Most of the time, users are oblivious to its source, they just switch the power on or fill up the car (Leggett and Finlay, 2001). To some a digital society implies growing dependence on networked ICT's, with more people using the internet, cell phones, digital video, digital music, and PC's (Yoo, 2006). Whether the focus is technology, economic, or societal, technology will have profound effects on natural resources. For instance the digital society implies growing reliance on electricity in supporting 21st century socioeconomic development, but there is little agreement on what these effects imply for the use of electricity (Baer et al, 2002). As by tradition these matters posit a heavier reliance on natural resources and hence require inclusion in the sustainability debate.

As the world braces itself for a sustainable viewpoint i.e. the new, low-carb economy, changing energy consumption by reverting to renewable alternatives to kerb emissions, The notion of development and progress in present-day society together with sustainable principles are complex and can only be contextually described with a given sets of beliefs i.e. a value system, Dovers, (1990) Pennycook (1999), Ecimovc (2007), Salingaros and Masden (2008). To understand the nature of acceptance, rejection, and distortion of any value system clarification of the system's values and functionality is required. Williams and Edge (1996) reported technologies are 'socially shaped' leaves open many important questions about the character and influence of the shaping forces. In seeking to grasp the complexity of the socio-economic processes involved in technological innovation, SST has been forced to go beyond simplistic forms of social determinism which, like technological determinism, see technology as reflecting a single rationality - for example an economic imperative, or the political imperative . For example a critique has been made of the dominant neo-classical tradition of economic analysis, with its assumptions that technologies will emerge readily in response to market demands (Coombs et al 1987), consequently radiating technological dependence and, economic dependence that illuminate sustainability in a society.

So why is sustainability important? Because it very absence is uncertainty, we as humans want belief that the world will last indefinitely. Therefore the concept of sustainability had

assumed a central place in global warming and climate change discussions, particularly in political policy making, Chukwumerije (2006) Houghton, (2007), to explain our existence and perhaps our future's road map. Since Climate change is a global environmental problem that needs global cooperation for its solution Abraham et al (2003) Luterbacher and Sprinz (2007). Coincidently Western Governments and institutions alike wrestle with the notion of climate change protocols, regimes and emission reduction targets for numerous reasons (young and levy,1999). Traditionally inventers used technology to solve problems Altshuller (1994), in addressing technology and society concerns one need to visit the concept of new technology, does it create its own needs? For example is it more likely to create other problems downstream/upstream by the suggested solution? Hence it is quintessential for the scientific community and policy makers to consider the societal and cultural impression of technology. After all sustainability is not defined in territorial modes, on the contrary we beg to ask the question "must sustainability work for all of Humanity?" if so must we consider the "universalability of sustainability" For instance the Drought is climate change currently experienced in Australia,CO_2, NOx/SOx, Ozone depletion, were all indiscriminate and know no geographical or national boundaries, similarly so are natural disasters as witnessed in the Asian tsunami of 2005. Thus, several factors have been identified to make international cooperation more likely: greater scientific consensus; increased public concern; burden sharing between nations; short term political benefits; and the existence of previous, related multilateral agreements (Hahn and Richards, 1989) as quoted in Grundmann (2007). Hence to arrive at a universal orthodoxy of sustainability is crucial to attain symmetry in the global warming debate. Thus to question the concept of humans as a family is a valid proposition in sustainability discussion, consequently the most biologically successful species on planet Earth, struggles with its fellow members, how do our primal instincts about competition and territoriality relate to sustainability and human intuition for survival and progress?

Conclusion

One of the perplexing dilemmas confronting contemporary society today is resolving the imbalance that exists, for example the World Health Organization (WHO, 2005) estimated that over one billion people were overweight globally, equally the U.N. Food and Agriculture Organization (FAO,2008) reported on 923 million people suffering from hunger. Therefore how can we as engineers in the western world understand the meaning of sustainability ? given that our profession contributes to wealth generation which seems to be a contributor to the imbalances. For example the Western world suffers from overweight and obesity a symptom of overconsumption, on the other side hunger and malnutrition dominates a significant portion of the world's population a consequence of under consumption? this raises the fundamental essence of humanity as family? Is humanity a family? This is a new reality on the ground, this reality presents contemporary society with an intractable problem of achieving sustainability and addressing the imbalance, together with global warming worries an estrangement of colossal portions, therefore sustainability definition in contemporary society must include justice for basic human needs. With the aid of analogy or metaphors, sustainability in contemporary society is a process that resembles human values a "libra" a balance, scale, of generational issues. This description is remanet of a mechanical system at equilibrium, where all the forces (or normative factors) acting on it are balanced; the forces in sustainability inquiry are social, economic, environmental and technological. This article

has raised some issues to direct further research in context-aware understanding of sustainability. Finally this article has demonstrated two subjects; that in order to examine the connectedness between sustainability, society and technology, the contextual implications of technology on cultural development or deterioration of technology in contemporary society needs to be considered. Also by framing "technology" in the not purely technical lens we have raised awareness of "contemporary society and technology" in sustainability contemporary society is an expansion from the traditional guard and sustainability requires a change of legacy for reducing our dependence on technology.

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